

# DIAMOND PRODUCTS

**OPERATOR'S MANUAL**

# **M-6 Core Bore Drilling Machine**

**IMPORTANT:  
READ MANUAL  
AND SAFETY  
PRECAUTIONS  
BEFORE  
OPERATING!**



# SAFETY WARNINGS

## PERSONAL SAFETY

- Read and understand this manual before operating the drill rig. Keep this manual with the drill rig for future use.
- Always wear safety approved hearing, eye, head and respiratory protection.
- Sturdy boots with non-slip soles aid in providing proper footing. Use of steel-toed safety boots are recommended.
- Under certain conditions, sparks may fly so never wear clothes of flammable material. Do not wear loose clothing or jewelry that could be caught in moving parts.
- Know how to stop drill quickly in case of emergency.
- Keep all parts of your body away from the core bit and all other moving parts.
- Use caution when loading and unloading the drill rig.
- Stay alert. Watch what you are doing and use common sense. Do not use the tool if you are tired or under the influence of drugs, alcohol or medication causing impaired control of the equipment.

## CORE BIT SAFETY

- Examine core bits before each use. The core bits should have no cracks, nicks, dents or flaws.
- Drill only the material that is specified for the core bit being used. Read the instructions with each bit to determine the material the bit can cut. If you are unsure, contact the manufacturer.

## GENERAL DRILL RIG SAFETY

- Rig must not be left unattended while the motor is running.
- Always keep both hands on the handles while the drill rig is running. When releasing carriage lock, maintain a firm grip on feed handle to prevent handle from revolving due to the weight of the core bit.
- Use extreme caution when drilling through floors. Provide for protection of all personnel and materials below the area. Usually, cores drop from the bit at the completion of the hole.
- Always secure the drill rig to the work surface with a minimum of 1/2 inch anchor bolt. Never stand on the base during drilling.
- Always check for proper alignment of moving parts, binding of moving parts, mounting, and damaged parts that may affect the drill rigs operation. Do not use the drill rig if parts are damaged or not working properly.
- Insure wrenches are removed from the drill rig before turning it on.
- Do not force the drill bit. The feed and speed rate should not overload the motor. Do not use more than 24 inches in extensions to start core bit.

## DRILLING/WORK AREA SAFETY

- **Never** operate the rig in any application or job where you are not trained or supervised.
- Operate only in well ventilated areas.
- Be sure there are no electric, water, or gas lines in the area you are drilling. Do not drill if you are unsure of the presence of utility lines in the work area.
- Keep bystanders and or animals out of the work area. Provide barriers or shields as needed.
- Keep the area clean and well lit. Mop up all excess water promptly.
- Keep the drill rig clean. Keep handles dry, clean, and free from oil and grease.
- Do not operate the drill rig in areas of combustible material or fumes. Sparks may occur from the bit that could cause a fire or explosion.

## GENERAL ELECTRICAL/HYDRAULIC SAFETY

- Always ground the drill rig to protect the operator from electric shock. The rig has a three connector cord and three prong grounding type plug to fit the proper grounding type receptacle. The green (or green and yellow) conductor is the ground wire. Never connect the green (or green and yellow) wire to a live terminal.
- Use only three-wire grounded extension cords suitable for use outdoors and of sufficient gage to accommodate power requirements. Inspect cords frequently and replace if damaged.
- Disconnect power source when not in use, before servicing and when changing core bits or accessories.
- Make sure the drill rig is turned off before connecting the power source.
- Never try to connect or disconnect the power unit while the power unit is running and/or the hydraulic hoses are under pressure.
- Do not exceed the rated operating pressure of hydraulic components. If you are unsure, contact the manufacturer or Diamond Products.
- Do not abuse the power cord. Never carry the tool by the cord or yank it to disconnect it from the receptacle. Keep the cord from heat, oil, and sharp edges.

***Failure to comply with preceding warnings could result in serious bodily injury!***

# DRILL RIG SECURING INSTRUCTIONS

**Caution:** It is very important that the drill rig is properly secured to the work surface. Movement during drilling will cause chatter of bit against the work surface, fracturing diamonds. Bit may also bind in hole, causing damage to the bit.

## Anchor Bolt Method to Floor or Wall

1. Measure distance from center of anchor slot in base to center of drill spindle.
2. Using measurement from Step # 1, locate anchor bolt position from center of hole to be drilled.
3. Drill and set a 1/2 inch anchor bolt at the location found in Step # 2.
4. Place slot in drill rig base over anchor hole and hand tighten anchor bolt.
5. Adjust leveling screws so that base is stable and mast is perpendicular to work surface. Secure machine by tightening anchor bolt.
6. When drilling cores greater than 24" in diameter, 2 anchor bolts are recommended for securing.

# OPERATING INSTRUCTIONS

## Warning:

1. For your own safety, read the entire operator's manual before using drill rig.
2. If drill rig is not securely anchored, it may result in damage to the rig and injury to the operator.
3. DO NOT plug motor into power source until rig is completely set up and ready to drill.

1. Thread drilling bit onto motor spindle and tighten securely with bit wrench.

**Caution:** Never turn drill on with bit resting on the concrete.

2. Check the alignment of bit with hole to be drilled by lowering bit until crown is approximately 1/2 inch above the work surface.
3. Select desired spindle speed by setting knob on the side of the drill motor. Follow recommendations found on bit speed chart below.

**Caution:** DO NOT move speed selector while drill spindle is rotating.

## BIT SPEED RECOMMENDATIONS

BIT DIA	RPM	BIT DIA	RPM	BIT DIA	RPM
1"	3184	8"	398	20"	159
2"	1592	10"	318	24"	132
3"	1061	12"	265	36"	88
4"	796	14"	227	42"	75
6"	530	18"	176	48"	66

4. With water control valve shut off, connect water inlet hose to drill and water source. Water can be supplied by a standard garden hose or by a pressure tank. Water is fed through inlet hose, down inside of bit, washing cuttings from under bit crown, up and outside of hole. Be sure that any method used has adequate water pressure to supply a flow of 1-2 gallons per minute. Lack of water can cause diamonds to polish or burn the bit, causing bit end to turn blue.
5. With drill motor ON/OFF switch in OFF position, plug power cord into a properly grounded 3-prong receptacle.

6. Open water valve at drill motor allowing water to flow at 1-2 gallons per minute.

**Caution: Before turning drill motor on, be certain that machine is securely anchored by a method described in this manual. Insure wrenches are removed from the bit and rig.**

7. Turn drill motor on.

**Caution: DO NOT apply full load when feeding bit until crown has penetrated material.**

8. Turn feed handle to apply load on bit. Remember to release carriage lock lever. To prevent bit from wandering, apply light pressure on feed handle when starting to drill.
9. Drill bit feed should be uniform without excessive force. Drilling penetration of 1-4 inches per minute may be achieved depending on material and bit diameter. Too little pressure can polish bit and too much can cause undue wear. When drilling through steel, such as rebar, decrease feed rate. It is recommended that after cutting steel, to stop and break out core and any loose pieces of steel, then proceed.

**Caution: When drilling steel embedded in concrete, never switch to high speed if drilling in low speed. These bits are not designed to drill through solid steel.**

## REMOVING CORES

### Breaking a Core

1. If you are not drilling a hole completely through, the core can easily be removed by breaking it out of the hole. Insert a screwdriver between the hole wall and the core and pry core toward the opposite side.
2. Use a second screwdriver to lift the core out.

### Removing Broken Core Below the Surface

1. Use a 1/8 inch diameter steel rod.
2. Make a 1/4 inch long, 90° bend at one end of the rod.
3. Insert rod down side of broken core to depth of break, twist 90° and lift core out.

### Removing Broken Core Stuck in Bit

**Warning: Unplug machine cord from power source.**

1. Increase water pressure and try to free the core with your hands.
2. If unable to free core, remove bit from drill.
3. Push core gently through from top of bit with a rod when using a capped bit.

## **Removing a Lodged Bit from Hole**

**Warning: Unplug machine cord from power source.**

1. Turn water on.
2. Using bit wrench, try to rotate bit in both directions and lift out using feed handle.

## **BIT TYPES AND EXTENSIONS**

### **Types of Bits**

1. Capped bits have an adapter welded onto the bit as one solid piece. The advantages of this type of bit are as follows:
  - simple installation and easy alignment
  - no expansion adapters to lose or forget
2. Open end bits require a three-piece expansion adapter. The top of the bit tube is machined to accept adapter which expands, locking itself firmly against the wall of the bit. The advantages are as follows:
  - They are reusable. Several bits of the same size can be used with the same adapter offering a savings in cost on each bit after initial cost
  - If the core becomes lodged in the bit, removing the expansion adapter makes core removal easier

### **Installing Open End Bit Expansion Adapters**

1. Screw 3-piece expansion adapter 2 full turns onto drill spindle.
2. Slide open end bit up to the top shoulder of the expansion adapter and turn with hands until snug.
3. Tighten in place with a strap wrench.

### **Installing Bit Extension Rods**

1. Drill to full depth of bit.
2. Back drill out and remove bit and core.
3. Put drill bit back into hole and connect a 4, 6, or 12 inch bit extension rod to bit and secure with bit wrench.
4. Screw bit extension rod onto drill spindle and secure with spindle wrench.
5. Proceed with drilling.

# MAINTENANCE INSTRUCTIONS

**Warning:** Make sure machine is unplugged from power source before making any adjustment.

## Motors

Check motor brushes every 50 hours minimum and replace when brushes become worn. For all other repairs, warranty or otherwise, drill motors must be taken to an authorized service center for evaluation and repair. Any attempt to service the motor by any other party will invalidate all warranty claims.

**For Weka:** Contact Diamond Products to be advised how to proceed with any motor problem aside from brush replacement.

## Lubrication

Keep a light coating of oil on rack and pinion and drill spindle.

## Carriage

The following procedure should be used in the adjustment of the M-6 roller carriage. Note that all new carriages are shipped with rollers tightly against the mast. This is to prevent the carriage from dropping down the mast and possibly causing an injury. This also allows the carriage to travel in a path parallel to the mast, thus preventing the drill bit from binding in the hole during use.

1. Side roller assembly adjustment can be accomplished by first removing the four socket head cap screws (No. 15) that hold the side roller assembly (No. 14) to the carriage plates (No. 21 & 22). By removing or adding .005" thick shims (No. 20) this adjustment can be accomplished.
2. The Adjustable Roller Assembly (No. 23) can be adjusted by first loosening the hex nut (No. 29) on each end of the eccentric shaft (No. 26). Now using a 3/8" wrench, turn the eccentric shaft (No. 26) so that the rollers move towards or away from the mast. After the rollers are in the desired position against the mast, retighten the hex nut (No. 29).

## Mast

Keep mast free of slurry so that parts that travel along the mast may move freely without binding.

## Machine Storage

Rig must be stored indoors or well covered in rainy weather.

## Bit Replacement

Bit is considered worn when the crown shows excessive wear and has become flush with the tube.

## Extensions

Caution - It is very important that the extension item no. 56 or no. 57, is bolted through the quick disconnect motor mount no. 62 with 3/8-16 x 2-1/2" capscrew no. 64.

Note: Maximum drilling capacity for 9.50" extension = 36" diameter.  
Maximum drilling capacity for 15.50" extension = 48" diameter.

Warning - When lifting bits with cores stuck inside bit, do not exceed lifting 2000 pounds.

Note: It is recommended that when drilling 24" & larger diameter holes, bolt the extension (No. 56 or 57) directly to the front of the carriage plates (No. 21 & 22).

## Ventilation

Keep drill motor inlet and air passage clear to ensure proper motor ventilation.

## **WARRANTY**

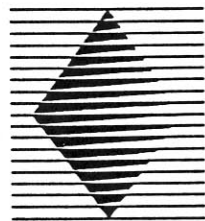
Diamond Products warrants all equipment manufactured by it against defects in workmanship or materials for a period of one (1) year from the date of shipment to Customer.

The responsibility of Diamond Products under this Warranty is limited to replacement or repair of defective parts at Diamond Products' Elyria, Ohio factory, or at a point designated by it, of such parts as shall appear to us upon inspection at such point, to have been defective in material or workmanship, with expense for transportation and labor borne by Customer.

In no event shall Diamond Products be liable for consequential or incidental damages arising out of the failure of any Product to operate properly.

Integral units such as engines, electric motors, batteries, transmissions, etc., are excluded from this Warranty and are subject to the prime manufacturer's warranty.

**THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND ALL SUCH OTHER WARRANTIES ARE HEREBY DISCLAIMED.**



# **DIAMOND PRODUCTS**

### **Corporate Office**

333 Prospect Street., Elyria, Ohio 44035

(216) 323-4616 - Fax: (216) 323-8689

Customer Service: 1-800-321-5336

Customer Service Fax: 1-800-634-4035